Improvement of laryngopharyngeal reflux symptoms after laparoscopic Hill repair

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Abstract

Background: People with proven gastroesophageal reflux disease may also experience symptoms such as voice loss, chronic cough, globus, and sore throat. These laryngopharyngeal reflux symptoms have been reported to respond to prolonged proton pump inhibitor therapy, but the Hill approach to resolving these specific individual symptoms has not been widely reported in surgical literature.

Methods: This clinical outcome study is an analysis of symptom improvement in 145 patients who underwent laparoscopic Hill hiatal hernia repair. A standardized questionnaire was used to score eight gastroesophageal reflux disease symptoms and four laryngopharyngeal reflux symptoms. Also, each patient’s primary chief complaints were analyzed.

Results: Gastroesophageal reflux and laryngopharyngeal reflux symptoms significantly improved (P < 0.01) compared with preoperative symptoms. Each patient’s primary chief complaints improved as well.

Conclusions: This clinical outcome analysis documents symptomatic improvement of laryngopharyngeal reflux and gastroesophageal reflux. Likewise, when these laryngopharyngeal reflux symptoms are chief complaints, with proven gastroesophageal reflux disease, the Hill approach to symptom resolution is likely to be successful. © 2003 Excerpta Medica, Inc. All rights reserved.

Keywords: Laryngopharyngeal reflux; Hoarseness; Cough; Globus; Sore throat; Laparoscopic Hill hiatal hernia repair

Gastroesophageal reflux disease has a wide symptom complex, usually resulting from the regurgitation of gastric contents through an incompetent lower esophageal sphincter. Patients with heartburn attribute their suffering to acid reflux. Symptoms also reported by gastroesophageal reflux disease patients include dysphagia, odynophagia, epigastric bloating, early satiety, chest pain, nocturnal awakening, and acid taste in the mouth. Frequently, these symptoms have a rapid and noticeable response to proton pump inhibitor therapy. Sustained response to gastroesophageal reflux disease symptoms have been reported with open [1] and laparoscopic Nissen fundoplication [2] as well as open [3] and laparoscopic Hill repair [4]. This study focuses on symptom resolution after the laparoscopic Hill repair.

Laryngopharyngeal reflux of gastric contents also results in a broad symptom complex, but the patient may not have concomitant typical gastroesophageal reflux disease symptoms. The most common laryngopharyngeal reflux symptoms are “hoarseness” (71%), chronic cough (51%), and globus (47%) [5]. The laryngopharyngeal reflux Consensus Report also lists sore throat, throat clearing, halitosis, and prolonged vocal warm-up as common symptoms [6]. These nonspecific symptoms have a wide differential diagnosis. Therefore, full evaluation may be required by colleagues from otorhinolaryngology, pulmonary medicine, allergy, or speech pathology to exclude significant pathology and implicate laryngopharyngeal reflux. Frequently, the diagnosis is detected after laryngoscopy, and gastroesophageal reflux disease is confirmed by endoscopy or ambulatory 24-hour esophageal pH monitoring. Until recently, pharyngeal pH monitoring has not been available to confirm diagnostic impressions [7,8].

The laryngopharyngeal reflux pathophysiology differs from gastroesophageal reflux disease. Laryngopharyngeal reflux tends to occur during the daytime, in the upright position, and results in transient exposure [6]. However, the
larynx is not suited to withstand acid and pepsin exposure and recovers slowly, causing prolonged symptoms. Consequently, the empiric medical treatment for laryngopharyngeal reflux requires lifestyle changes and a prolonged optimal acid suppression, with proton pump inhibitors twice daily for 2 to 3 months [6,9]. The regurgitation persists, however, so the larynx is still exposed to pepsin and bile [10]. Naturally, compliance with such a regimen is suboptimal, but patients who comply are likely to respond [11]. In a recent collective review, Wong et al [12] found favorable response rates varying from 50% to 100%.

Significant laryngeal pathology is attributed to laryngopharyngeal reflux and is seen during laryngoscopy. These include laryngeal edema (89%), arytenoid erythema (87%), granuloma/granulation (19%), and ulceration (2%) [5,12]. Long-term exposure can result in structural deterioration resulting in laryngeal or tracheal stenosis, pachydermia laryngea, leukoplakia, and even laryngeal cancer [13]. Also, laryngeal exposure to acid can result in paroxysmal laryngospasm in adults and is a suspected cause of sudden infant death [6].

A surgical solution to resolving specific laryngopharyngeal reflux symptoms is less frequently described in the literature than is an analysis of the common symptoms attributed to gastroesophageal reflux disease. Usually, symptoms are grouped and not specifically reported. Johnson et al [14] stated that the beneficial effects of antireflux surgery on respiratory symptoms are less predictable (76%) than gastroesophageal reflux disease symptoms (86%). Hunter et al [2] reported a 70% response among patients with atypical symptoms. Zeitels et al [15] also reported atypical symptoms response to surgery as quite variable: pulmonary (asthma and chronic cough) 78%, laryngeal (voice loss, globus, sore throat, enamel loss, halitosis) 58%, and chest/epigastric pain 48%. For a community surgeon assessing a patient whose chief complaint is laryngopharyngeal in nature, there are no data regarding symptom-specific surgical response rates. The patient and surgeon need this information in order to assess a risk-benefit ratio. The study described herein provides substantive surgical data on specific laryngopharyngeal reflux symptoms.

Methods

A clinical outcome study was undertaken in a community setting. The study encompassed 153 consecutive patients diagnosed with gastroesophageal reflux disease/laryngopharyngeal reflux who also underwent laparoscopic Hill hiatal hernia repair by the author between March 1997 and March 2000. Each patient participated in this study by completing symptom questionnaires preoperatively and postoperatively regarding his or her gastroesophageal reflux disease symptoms, chief complaints, asthma, and laryngopharyngeal reflux symptoms. These laryngopharyngeal symptoms included voice loss, chronic cough, “something stuck in the throat” (globus), and sore throat. The severity of each symptom was scored by each patient on a scale from 0 to 4: 0 = never, 1 = rarely, 2 = occasionally, 3 = frequently, 4 = always. On the preoperative questionnaire, each patient wrote in one or two “most bothersome” symptoms, their chief complaints. These were always severity scored as 3 or 4. Postoperatively, the patients were asked to rate those same chief complaints on the 0 to 4 scale.

The term “heartburn” was not used in the questionnaire because of nonspecificity. Instead, symptoms that parallel heartburn such as chest pain, upper abdominal pain, regurgitation, and “acid taste in the mouth” were individually evaluated. Typical gastroesophageal reflux disease symptoms such as “painful swallowing” (odynophagia), “food getting stuck” (dysphagia), and sleep loss were also surveyed. These 153 patients were subsequently contacted by mailed questionnaire in August 2000. Included in this mailing was the consent to participate in the study. Those patients not returning questionnaires received additional questionnaires until completed. Privacy was protected by identification codes in the follow-up mailing. There were only 8 unreturned or nonconsenting questionnaires. Consequently, this study focuses on the 145 patients who participated, giving a 95% return rate.

The patients self-rated their symptoms. The difference between the preoperative scores off medications and the corresponding postoperative scores were statistically evaluated. In particular, patients who scored symptoms “always” (4) or “frequently” (3) were analyzed for symptom improvement. Statistical analysis was performed using a paired one-sample t test on the difference between the preoperative and postoperative scores, with significance set at P < 0.01. Each patient’s chief complaints were similarly analyzed by calculating the difference between the preoperative and postoperative scores.

Among the asthmatics, postoperative asthma improvement was queried. The asthma patients noted whether their asthma was the “same,” “gone,” or “more manageable” on the follow-up questionnaire. Those who had been on prednisone intermittently or continuously preoperatively were asked if they had been weaned off the steroids.

Initially, all patients had objective evidence of significant gastroesophageal reflux by the endoscopic findings of grade II or III esophagitis (by the Savary-Miller grading scale), stricture, Barrett’s esophagus, or positive pH monitoring (Table 1). Depending upon which community laboratory analyzed the tests, an abnormal esophageal 24-hour pH monitoring was defined by the DeMeester or Johnson/DeMeester scoring system. Consequently, not all patients have pH data, and when present they are not uniformly reported. All patients underwent esophageal manometry preoperatively. Four community laboratories were utilized, so reporting of results was not uniform, and the term “ineffective esophageal motility” was not yet in use.

Patients with primary laryngopharyngeal reflux symptoms underwent laryngoscopy by an otorhinolaryngologist,
but this was not required, and laryngoscopy results were not tabulated. Patients suffering postprandial bloating were evaluated by solid phase gastric emptying study, and right upper quadrant pain was evaluated by an ultrasound to exclude gallstones. If diagnosed, Helicobacter pylori was treated prior to surgical intervention. Patients who primarily underwent the open procedure, who were reoperative gastroesophageal reflux disease patients, or who had gastroparesis or bile gastritis requiring other gastric procedures were excluded from this evaluation. On the contrary, patients were included if they required simultaneous cholecystectomy, liver biopsy, or paraesophageal hernia repair.

The operative technique for the laparoscopic Hill repair has been described by Aye [4]. The technique used for this study is similar. Five laparoscopic ports are placed, similar to laparoscopic Nissen fundoplication. As with laparoscopic Nissen fundoplication, the hiatus is dissected and the hernia is closed posteriorly. TFE polymer pledgets are utilized with each suture placement. Extra dissection is completed to clear the caudal fibers of the right and left crus—the preaortic fascia. The short gastric vessels are left intact. A plication of the gastroesophageal junction is accomplished by placing three sutures sequentially through the anterior, then posterior phrenoesophageal bundles, then through the preaortic fascia. The sutures are tightened with a 46F bougie in the esophagus. The bougie is withdrawn and advanced twice through the repair to assure no misdirection, hang-up, or perforation results. Complications were tracked from in-office quality assurance data, hospital discharge summaries, and clinic charts. Hospital length of stay, operative time, and cost/charging data were not evaluated.

### Results

Complete follow-up data were obtained from 145 of the 153 gastroesophageal reflux disease/laryngopharyngeal reflux patients (94.8% returned questionnaires). The mean follow-up time after surgery was 20 months with a standard deviation of 9 months. The average patient age was 46 years with a standard deviation of 11 years. Sixty percent of the patients were women, with a mean weight of 82 kg (181 lb) at the time of surgery. Forty percent were men with a mean weight of 90 kg (197 lb) at surgery. Table 1 shows proof of acid reflux in 145 patients. The preoperative findings of weak (<30 mm Hg distal esophagus), or disordered peristalsis (3 of 10 peristalsis are not transmitted) were shown in 14 patients (10%).

There were no operative or postoperative deaths. One patient experienced retroperitoneal bleeding 18 hours postoperatively and required open exploration and transfusion. One patient suffered cervical perforation of the esophagus by bougie, which was recognized and repaired at the original surgery. Conversion to an open abdominal procedure was not required during any primary procedure. Two patients had pulmonary embolus 1 week postoperatively, requiring anticoagulation. Reoperation for severe odynophagia was required for 1 patient, and remained unexplained by operative findings. Splenectomy was not performed on any patient.

Gastroesophageal reflux disease symptoms were frequently reported and were responsive to surgery with significant improvement (Table 2). Laryngopharyngeal reflux symptoms, though less frequent, similarly responded, all statistically significant (Table 3) by a paired one-sample t test of the difference between preoperative scores (3,4) and postoperative scores (0 to 4).

Improvement of each patient’s chief complaints was assessed by patient self-evaluation on a questionnaire. Many patients listed two separate symptoms as chief complaints. Table 4 and Table 5 demonstrate improvement in all gastroesophageal reflux symptoms and laryngopharyngeal reflux chief complaints.

Follow-up of patients diagnosed preoperatively with asthma was available in 40 patients. These patients reported asthma as “cured” in 10 (25%), “more manageable” in 19 (48%), and “not improved” in 11 (28%; Table 6). Of the 37 preoperative patients whose asthma treatment required prednisone, 22 (59%) patients did not need prednisone after surgery.

Persistent postoperative dysphagia prompted esophageal dilatation in 15 patients (10%). Of the 73 patients who experienced bloating preoperatively, bloating persisted postoperatively in 14 (19%) patients. This is the gastroesophageal reflux symptom least likely to fully resolve (Table 2); and when bloating is the chief complaint (8%), it is also least likely to resolve (33%; Table 4).

There were four “failed” surgeries, documented by abnormal esophagogastroduodenoscopy findings or esophageal pH monitoring. Three additional patients taking proton pump inhibitors were presumed failures but have declined confirmatory testing. Four other patients are experiencing epigastric symptoms but have normal esophageal pH monitoring. Thus, the estimated failure rate is 7 of 145 (5%). Reoperation for recurrent gastroesophageal reflux disease was performed in 2 (1%) of these patients.

### Table 1

<table>
<thead>
<tr>
<th>Principal proof</th>
<th>Number of patients, 145 studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal pH monitoring</td>
<td>55 (38%)</td>
</tr>
<tr>
<td>Esophageal stricture</td>
<td>32 (22%)</td>
</tr>
<tr>
<td>Grade II or III esophagitis</td>
<td>30 (21%)</td>
</tr>
<tr>
<td>Barrett’s esophagus</td>
<td>16 (11%)</td>
</tr>
<tr>
<td>Esophageal ulcer</td>
<td>6 (4%)</td>
</tr>
<tr>
<td>Esophagitis, abnormal lower esophageal sphincter pressure, and hiatal hernia†</td>
<td>6 (4%)</td>
</tr>
</tbody>
</table>

* Most outstanding symptom, although most patients had a combination of symptoms.
† A combination of suggestive findings but refused pH monitoring.
Comments

Patients suffering from gastroesophageal reflux disease and laryngopharyngeal reflux experience a wide variety of symptoms. Typically, the patient suffers an adverse impact of quality of life and seeks relief. Unfortunately, when laryngopharyngeal reflux symptoms are predominant, the patient may experience a delay in diagnosis and prolonged empiric therapy. Those who are resistant to medical management may seek surgical consultation. Previously, surgeons have not had much clinical data to predict response of symptoms to surgical repair. This study of patients with proven gastroesophageal reflux demonstrates that laryngopharyngeal reflux symptoms are as likely as typical gastroesophageal reflux disease symptoms to respond to surgery. More importantly, patients with specific laryngopharyngeal reflux symptom chief complaints are likely to find symptom resolution with surgical therapy.

“Hoarseness” is the most commonly reported symptom (71%) of laryngopharyngeal reflux in Koufman’s series [5]. Our questionnaire specified “voice loss,” a related but more severe symptom, which perhaps accounted for a lower reported rate, 36 of 145 (25%). Voice loss resolved in 89% of the patients. However, it may take 4 to 6 months for vocal recovery. In this study, voice loss was an uncommon chief complaint that prompted surgical intervention (only 3 patients). These patients were particularly motivated because they were unable to perform their major work or recreational activities owing to voice impairment, and medicine was not curing the condition. One was a vocal performer, 1 a vocal therapist, and 1 a schoolteacher, and none had typical gastroesophageal reflux disease symptoms. It is particularly satisfying that none of these patients have persistent postoperative symptoms, and all 3 are presently using their voices extensively. For these patients, a good surgical outcome was very speculative preoperatively due to an absence of published data.

Gastroesophageal reflux disease is among the three most common causes of chronic cough in all age groups [16]. The full differential diagnosis must be evaluated to avoid the pitfall of operating on patients with underlying undiagnosed cancer or infection of the lung or larynx. Many patients will be treated as asthma patients empirically, with no success. Appropriate medical treatment is successful in 70% of laryngopharyngeal reflux coughing patients, but only after 2

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### Table 2
Gastroesophageal reflux disease symptoms evaluated in 145 patients studied

<table>
<thead>
<tr>
<th>Symptom rated by patient as frequent (3) or always (4)</th>
<th>Preoperative patients experiencing symptom*</th>
<th>Postoperative patients with persisting symptom†</th>
<th>Postop patients with symptom improvement‡</th>
<th>P value§</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloating</td>
<td>73 (50%)</td>
<td>14 (19%)</td>
<td>59 (81%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>44 (30%)</td>
<td>6 (14%)</td>
<td>38 (86%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Regurgitation</td>
<td>102 (70%)</td>
<td>9 (9%)</td>
<td>93 (91%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Odynophagia</td>
<td>84 (58%)</td>
<td>8 (10%)</td>
<td>76 (90%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Chest pain</td>
<td>68 (47%)</td>
<td>4 (6%)</td>
<td>64 (94%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Epigastic pain</td>
<td>86 (59%)</td>
<td>5 (6%)</td>
<td>81 (94%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Sleep loss</td>
<td>97 (67%)</td>
<td>6 (6%)</td>
<td>91 (94%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Acid taste</td>
<td>75 (52%)</td>
<td>4 (5%)</td>
<td>71 (95%)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

* Preoperative number (%) of patients of 145 total that score gastroesophageal reflux disease symptom 3, 4.
† Postoperative number (%) from previous column that score gastroesophageal reflux disease symptom as 3, 4.
‡ Postoperative number (%) from first column that score gastroesophageal reflux disease symptom as 0, 1, 2.
§ Comparing preoperative minus postoperative scores by a one-sample paired t test (P < 0.01).

### Table 3
Laryngopharyngeal reflux evaluated in 145 patients studied

<table>
<thead>
<tr>
<th>Symptom rated by patient as frequent (3) or always (4)</th>
<th>Preoperative patients experiencing symptom*</th>
<th>Postoperative patients with persisting symptom†</th>
<th>Postoperative patients with symptom improvement‡</th>
<th>P value§</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice loss</td>
<td>36 (25%)</td>
<td>4 (11%)</td>
<td>32 (89%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Cough</td>
<td>60 (41%)</td>
<td>5 (8%)</td>
<td>55 (92%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Globus</td>
<td>54 (37%)</td>
<td>6 (11%)</td>
<td>48 (89%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Sore throat</td>
<td>62 (43%)</td>
<td>5 (8%)</td>
<td>57 (92%)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

* Preoperative number (%) of patients of 145 total that score laryngopharyngeal reflux symptom as 3, 4.
† Postoperative number (%) from previous column that score laryngopharyngeal reflux symptom as 3, 4.
‡ Postoperative number (%) from first column that score laryngopharyngeal reflux symptom as 0, 1, 2.
§ Comparing preoperative scores minus postoperative scores by a one-sample paired t test (P < 0.01).
to 3 months of proton pump inhibitor therapy [16]. In this study series, 92% of the patients experienced resolution of cough upon long-term follow-up. This high response rate had not yet been evident when patients were seen in routine follow-up at 6 to 8 weeks after surgery; apparently laryngeal changes had not yet healed. When a persistent cough is one of the chief complaints, the resolution is 71%. It is relevant to note that of the 14 patients who were frequently coughing, only 1 is not improved (Table 5). The diagnostic overlap of gastroesophageal reflux disease/laryngopharyngeal reflux with concurrent allergies, sinus problems, and asthma may account for the 29% who are still coughing “sometimes.” In this study, patients were not subjected to routine pulmonary function testing and laryngoscopy to accurately discern asthma from laryngeal injury. Many of the cough and asthma patients overlap, and future studies could be better structured to define these parameters.

Gastroesophageal reflux disease patients with respiratory symptoms have received more attention in the surgical literature. In 1979, Pelligirini and DeMeester [17] reported gastroesophageal reflux disease-related aspiration on pH monitoring being associated with onset of cough. These patients frequently had impaired esophageal clearance when supine. These aspirations were improved with open Nissen fundoplication. In a 1996 article, Johnson [14] reported fundoplication as successfully relieving respiratory symptoms in 76% of patients. The patients least likely to improve were those who had abnormal esophageal motility. So [15] reported 78% of patients with cough and asthma improved after laparoscopic fundoplication.

In a 1997 comparison of medical and surgical management of respiratory symptoms, Wetscher et al [10] found 85.7% improvement after laparoscopic fundoplication; they also noted improved peristalsis after surgical repair. More recently, Patti et al [18] found 83% improvement after surgery among patients whose pH monitoring correlated cough with reflux. Overall, 64% with wheezing and 74% with cough improved in their series. A recent large retrospective study at the Mayo clinic found 83% of gastroesophageal reflux disease patients with respiratory symptoms responded to surgery that utilized a variety of surgical techniques [19]. This study had an average follow-up of 65 months, indicating durable results. In this current study, 73% of patients with asthma symptoms were improved, and

### Table 4
Chief complaints related to gastroesophageal reflux disease symptoms in 145 patients studied

<table>
<thead>
<tr>
<th>Chief complaint</th>
<th>Preoperative patients*</th>
<th>Postoperative persistent symptoms†</th>
<th>Postoperative symptom improvement‡</th>
<th>Postoperative symptom resolution§</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloating</td>
<td>12 (8%)</td>
<td>4 (33%)</td>
<td>1 (8%)</td>
<td>7 (58%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>8  (6%)</td>
<td>0</td>
<td>2 (25%)</td>
<td>6 (75%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Odynophagia</td>
<td>25  (17%)</td>
<td>1 (4%)</td>
<td>2 (8%)</td>
<td>22 (88%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Regurgitation</td>
<td>50  (34%)</td>
<td>4 (8%)</td>
<td>2 (4%)</td>
<td>44 (88%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Chest pain</td>
<td>12  (8%)</td>
<td>1 (8%)</td>
<td>10 (83%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epigastric pain</td>
<td>22  (15%)</td>
<td>3 (14%)</td>
<td>4 (18%)</td>
<td>15 (68%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Sleep loss</td>
<td>9   (6%)</td>
<td>0</td>
<td>9 (100%)</td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Acid taste</td>
<td>14  (10%)</td>
<td>1 (7%)</td>
<td>1 (7%)</td>
<td>12 (86%)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

* Patients reported having gastroesophageal reflux disease type symptoms as chief complaints.
† Postoperative number (%) from previous column experiencing persistent symptoms, scored 3, 4.
‡ Postoperative number (%) from first column sometimes feeling chief complaint, scored as 2.
§ Postoperative number (%) from first column with chief complaint resolution, scored as 0, 1.
* Comparing preoperative scores minus postoperative score by a one-sample paired t test (P < 0.01).

### Table 5
Chief complaints related to laryngopharyngeal reflux symptoms in 145 patients studied

<table>
<thead>
<tr>
<th>Chief complaint</th>
<th>Number of patients out of 145*</th>
<th>Postoperative rated frequently (3) or always (4)†</th>
<th>Postoperative rated sometimes (2)‡</th>
<th>Postoperative rated rare (1) or never (0)§</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice loss</td>
<td>3   (2%)</td>
<td>0</td>
<td>0</td>
<td>3 (100%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Cough</td>
<td>14  (10%)</td>
<td>1 (7%)</td>
<td>2 (14%)</td>
<td>11 (79%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Globus</td>
<td>11  (8%)</td>
<td>1 (9%)</td>
<td>1 (9%)</td>
<td>9 (82%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Sore throat</td>
<td>10   (7%)</td>
<td>0</td>
<td>2 (20%)</td>
<td>8 (80%)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

* Patients reported having laryngopharyngeal reflex type symptoms as chief complaints.
† Postoperative number (%) from previous column experiencing persistent symptoms, scored 3, 4.
‡ Postoperative number (%) from first column sometimes feeling chief complaint, scored 2.
§ Postoperative number (%) from first column with chief complaint resolution, scored 0, 1.
* Comparing preoperative minus postoperative scores by a one-sample paired t test (P < 0.01).
59% of those previously on prednisone were no longer needing this therapy (Table 6).

Globus is a frustrating symptom for patients, especially when it is an isolated laryngopharyngeal reflux symptom. The “hystericus” label is historically inferred and the International Classification of Disease, ninth edition, code (p 472.1) for “globus” is in the psychiatric diagnosis grouping! Until typical posterior laryngeal findings are noted, the etiology may not be clear, so globus patients require complete diagnostic ear, nose, and throat evaluation. When gastroesophageal reflux is found, this study indicates 89% assurance of symptom resolution with surgery. Additionally, a patient whose chief complaint is globus should experience symptom resolution 82% of the time, with another 9% experiencing decreased frequency.

Patients with sore throat also show high rates of improvement after surgery. Many are treated empirically for allergies or recurrent infections but have responded best to proton pump inhibitors. All should have complete head and neck evaluation prior to surgery for gastroesophageal reflux disease/laryngopharyngeal reflux, to rule out concurrent disease. If gastroesophageal reflux is proved, 92% of patients should experience resolution of sore throat. Among those with a chief complaint of sore throat, 80% should have resolution.

In this study, the clinical suspicion of laryngopharyngeal reflux was confirmed by evidence of gastroesophageal reflux. Some patients were found to have prominent proximal acid reflux by dual probe pH monitoring (Table 1). A new pH-monitoring probe has been designed, specifically to detect laryngopharyngeal reflux. In this technique, two or three pH probes are utilized, with the upper probe being placed just above the upper esophageal sphincter, adjacent to the arytenoids [7,8]. A normative database was developed, and laryngopharyngel reflux can now be quantitatively documented. Future studies will undoubtedly employ this new technique of pH monitoring.

A new algorithm for patients managing suspected laryngopharyngeal reflux symptoms might be emerging. Until recently, these patients have been treated empirically, anticipating difficulties with compliance and variable response. Instead, it may be advisable to follow complete ear, nose, and throat evaluation with pharyngeal pH monitoring to confirm laryngopharyngeal reflux with a reliable diagnosis. The patient can then be counseled regarding the anticipated duration of medical treatment, and can be apprised more accurately of the potential for response to therapy, both medical and surgical.

Further study of laryngopharyngeal reflux may be improved by providing a wider data base of symptoms, including not only cough, sore throat, voice loss and globus but also throat clearing, halitosis, enamel loss, paroxysmal laryngospasm, postnasal drip, vocal fatigue, prolonged vocal warm-up, water brash, and excessive mucus production. Additionally, preoperative and postoperative laryngoscopy with documentation of accompanying physical findings would be helpful to ear, nose, and throat specialists.

Questionnaire data are frequently criticized for lack of objectivity. This study could be improved by routine postoperative 24-hour esophageal pH-monitoring, or laryngoscopy to confirm resolution of objective findings. However, this approach is not feasible in the community setting. Even without such objective methods, the high response rate and statistical significance of the results from this study demonstrate a true improvement among these patients.

This study confirms the safety and effectiveness of laparoscopic Hill repair in the treatment of patients with documented gastroesophageal reflux disease. Additionally, specific laryngopharyngeal reflux symptoms in patients with proven reflux are now shown to be just as responsive to surgery as are typical gastroesophageal reflux disease symptoms. Patients experiencing chronic cough, voice loss, globus, or sore throat in the setting of gastroesophageal reflux disease can be assured of statistically significant symptom improvement after antireflux surgery. Likewise, when these laryngopharyngeal reflux symptoms are chief complaints, with proven gastroesophageal reflux disease, a surgical approach to symptom resolution is likely to be successful.

References


